I claim:

1.   A method of processing sonic wireline or logging while drilling data acquired in a borehole comprising:

      a) filtering the sonic data to attenuate borehole-borne arrivals;

5   b) migrating the filtered sonic data; and

      c) beamforming the filtered and migrated sonic data the determine the position of a reflector with respect to the borehole.

2.   The method of claim 1, wherein said filtering comprises adaptively filtering

10   the sonic data.

3.   The method of claim 1, wherein said filtering comprises applying a filter that attenuates noise in only two of four quadrants of fk-space.

15   4.   The method of claim 3, wherein said sonic data is shifted before said filter is applied to place desired signal within said sonic data into a quadrant that is not affected by said filter.

5.   The method of claim 1, wherein said migrating comprises generalized radon

20   transform migrating the filtered sonic data.

6.   The method of claim 1, wherein said beam-forming comprises applying an adaptive beam-forming filter.

7.   The method of claim 1, further comprising displaying the position of the sonic reflector with respect to the borehole.

8.   The method of claim 1, further comprising determining an azimuth and distance to said reflector downhole and transmitting said azimuth and distance to the surface.

9.   The method of claim 8, further comprising using said azimuth and distance to geosteer drilling of said borehole.

10.   A method of processing sonic data acquired in a borehole by a tool having a plurality of receivers positioned such that they are spatially separated when their positions are projected onto a plane perpendicular to the central axis of the borehole comprising:

    a) processing the sonic data to attenuate noise and to correct for a difference between an apparent position and a true position of a seismic reflector; and

    b) determining a position of a sonic reflector with respect to the borehole by triangulating said processed sonic data obtained from different receivers of the borehole tool.

11.   The method of claim 10, further comprising displaying the position of the sonic reflector with respect to the borehole.

12.   A method of filtering data obtained within a borehole and allowing for

changes in source signature comprising:

determining a filter effectively minimizing prediction-error energy using a

group of preceding samples on preceding traces and a group of following samples on

5   following traces; and

applying said filter to said data to attenuate borehole-borne noise within said

data.

13.   The method of claim 12, wherein said filter is adaptive.

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14.   The method of claim 12, wherein said data is shifted before said filter is

applied to place desired signal within said data into a quadrant that is not affected by

said filter.

15   15.   The method of claim 12, wherein said filter has filter weights that are

determined using an adaption process.

16.   The method of claim 15, where said adaption process comprises letting the

filter weights slowly adapt in the direction of the steepest descent for the error energy.

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17.   The method of claim 16, wherein letting the filter weights slowly adapt

comprises limiting the amount of change to 1% per sample point each time the filter is

run through the data.

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18.   The method of claim 12, wherein the prediction-error, $e_{m,n}$, for trace m, sample

n associated with said filter can be characterized as:

$$e_{m,n} = d_{m,n} - \sum_{j=m-1}^{m-J} \sum_{k=L}^{M} w_{j,k} d_{j,n-k} - \sum_{j=m+1}^{m+J} \sum_{k=L}^{M} w_{j,k} d_{j,n+k} .$$

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